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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/460,630	12/14/1999	BART DIERICKX	IMEC87.001CP	2743

20995 7590 01/24/2003

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EXAMINER

LEE, EUGENE

ART UNIT	PAPER NUMBER
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2815

DATE MAILED: 01/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/460,630

Applicant(s)

DIERICKX, BART

Examiner

Eugene Lee

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The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 November 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 and 13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 and 13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 December 1999 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the amplifier must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

2. The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

Misnumbered claim 12 has been renumbered 13.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

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4. Claims 1 thru 11 and 13 rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The specification does not disclose the invention as comprising an amplifier integrated in the pixel structure for amplifying the collected charge.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 13 recites the limitation "second region" in line 2 of said claim. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1 and 4 thru 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miwada '719 in view of Dyck '228. Miwada discloses (see, for example, FIG. 2) a solid state imaging device (pixel structure) comprising a p-type silicon substrate 1, thick oxide film

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(insulating layer) 2, n-type rectangular region (collection region) NR1, transfer gate electrode (dual-purpose electrode) 8, and n-type impurity region (detection region) NR2. Area 3b comprises the n-type rectangular region (collection region) NR1 and vertical shift register 7 comprises the n-type impurity region (detection region) NR2. A photo radiation is fallen onto area 3b and when a low voltage level is applied to the transfer gate, charges will collect in area 3b. When a high voltage level is applied to the transfer gate, the charges will transfer to the vertical shift register. See, for example, column 2, lines 1-20. Miwada does not disclose an amplifier integrated in the pixel structure for amplifying the collected charge. However, Dyck discloses (see, for example, column 1, lines 65-*) a solid state image device comprising an charge-sensitive amplifier that generates a voltage output signal corresponding to the sizes of the charge packets. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to include the amplifier of Dyck in Miwada's invention in order to generate a voltage output signal corresponding to the size of the charges.

Regarding claims 1-11 and 13, the recitation "active CMOS pixel structure" has not been given patentable weight because it has been held that a preamble is denied the effect of a limitation where the claim is **drawn to a structure** and the portion of the claim following the preamble is a self-contained description of the structure **not** depending for completeness upon the introductory clause. *Kropa v. Robie*, 88 USPQ 478 (CCPA 1951).

It should also be noted that the applicant's specification applies to CCDs (see page 7, first paragraph); a structure that is clearly focused on in the specification and the drawings.

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9. Claims 2, 3, 7, 8, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miwada '719 in view of Dyck '228 as applied to claims 1 and 4 thru 6 above, and further in view of Kuroda et al. '013. Miwada in view of Dyck does not disclose a barrier region of the first conductivity type with a concentration density of dopants being higher than the concentration density of dopants in the substrate. However, Kuroda discloses (see, for example, FIG. 5) a solid state image pickup element comprising a p+-type layer (barrier region) 13 surrounding an n-type region 5, 11. Kuroda teaches that providing such a layer will redirect a charge 14 to the photodiode 1. See, for example, column 2, lines 56-*. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to include the p+-type layer underneath the n-type diffused layer of Miwada in view of Dyck in order to direct charges to the pn junction and, consequently, reduce smearing, as taught by Kuroda.

10. Claims 9 thru 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miwada '719 in view of Dyck '228 as applied to claims 1 and 4 thru 6 above, and further in view of Hook et al. '702 B1. Miwada in view of Dyck does not disclose a pinning region. However, Hook discloses (see, for example FIG. 31) an active pixel sensor cell comprising a pinning region 70 partially covered and self-aligned with gates 68, 68'. See, for example, column 5, lines 3-18. It was well known in the art at the time of invention that pinning regions were used to improve the gathering of electrons within a semiconductor layer. See, for example, column 1, lines 15-23. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to include the pinning region of Hook in Miwada in view of Dyck in order to improve the collection and retention of electrons within the n-type diffused layer (collection region).

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Response to Arguments

11. Applicant's arguments with respect to claims 1-11 and 13 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

INFORMATION ON HOW TO CONTACT THE USPTO


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eugene Lee whose telephone number is 703-305-5695. The examiner can normally be reached on M-F 8-5.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on 703-308-1690. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Eugene Lee
June 5, 2002



EDDIE LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

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Eugene Lee
January 21, 2003